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SOCIOCULTURAL INFLUENCES ON PSYCHOSOCIAL ADJUSTMENT IN ANTARCTICA

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SUMMARY

Problem

Psychological stress is a "normal" part of wintering-over in the Antarctic given the unusual living conditions of small groups, the harsh environment, and the prolonged isolation from outside contact. In some individuals, this stress is so severe that it impairs their health and performance during the winter-over period. Sources of variation in the degree of stress must be identified.

Objective

The object of this paper is to identify the major sociocultural factors involved in adaptation to this environment, to examine the relationship between these factors and variations in adaptation, as reflected by measures of health and performance, and to explore the relationship between social and individual traits which promote or inhibit adaptation.

Approach

This paper is based on the concept of "ethnography at a distance," using data collected from Antarctic research stations of different nationalities. Data on American stations included interviews with members of past winter-over expeditions, station logs, debriefing reports by Navy psychiatrists and clinical psychologists, personality profiles and biographical data obtained from the "Operation Deep Freeze" screening program, and data collected by Dr. Eric Gunderson on winter-over personnel.

Three particular sets of sociocultural factors were examined in this study: (1) those located in the individual personality; (2) those located in the sociocultural backgrounds of station personnel; and (3) those located in the sociocultural systems of the stations themselves.

Results

In an attempt to account for variations in the "winter-over syndrome," three observations were made. First, individuals with inner-directed or introverted personalities appear to adapt better to Antarctic life than those with group-centered or extraverted personalities. Second, subgroups representing certain sociocultural backgrounds such as the civilian scientists appear to adapt better than other subgroups such as Navy construction personnel. Third, the social comparison processes which generate group cohesion also generate group conflict. One of the strongest bases for this conflict has been differences in occupational status in the station itself.

Conclusion

Certain conflicts emerge from the interaction of the three sets of sociocultural influences examined. The process of social comparison which fosters group homogeneity also generates perceptions of relative control over the social environment and self-esteem. Those people who perceive themselves to be powerless or helpless because they cannot exercise autonomy in either a social or a psychological sense have the greatest difficulty in adjusting to the Antarctic environment. Resources enabling one to deal with similar

conflicts in the outside world are absent here, while strategies such as social isolation may be viewed as adaptive in this particular environment. Other processes, such as values, group behavior, and group identity serve to bring together a group of individuals whose sociocultural and personality idiosyncracies are integrated into a cultural form common to the confined or isolated group.

Recommendations

Screening procedures should be modified to determine which individuals will be able to exercise a sense of autonomy in this particular social environment. Organization of station personnel should allow for individuals with different backgrounds to maintain some sense of status and self-control.

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Sociocultural Influences on Psychosocial Adjustment in Antarctica

Introduction

Although there are no permanent inhabitants of Antarctica,¹ since World War II there have been more or less permanent habitations in the form of scientific research stations. Flying the flags of fourteen countries at last count, some of these stations operate only during the summer months while 52 are currently operated on a year-round basis. Ranging in size from a half-dozen to over 1,000 members, each station is said to possess a distinct microculture serving as a model of as well as a model for (Geertz 1973) the processes of adaptation to the stressors associated with this extreme, isolated environment.

The object of this paper is to identify the major sociocultural factors involved in adaptation, to examine the relationship between these factors and variations in adaptation, as reflected by measures of health and performance, and to explore the relationship between social and individual traits which promote or inhibit adaptation.²

The Physical and Social Environment

The sociocultural systems of Antarctic research stations exist in perhaps the most severe and stressful environment on earth. Antarctica is the highest, coldest, driest, and windiest of the world's continents. Winter temperatures average -60F and winds exceeding 150 miles per hour are not uncommon. Plant and animal life are largely confined to the coastal regions. At the south pole, the atmospheric pressure is equivalent to an altitude of approximately 3353 meters (11,000 feet) above sea level in temperate zones. The mean annual temperature is -51C (-59.8F), and temperatures range from -17C (+4F) down to -85C (-121F). The relative humidity is too low to permit accurate measurement. Finally, the annual seasons consist of one continuous day (summer) and one continuous night (winter), each lasting approximately six months (Natani and Shurley 1974:91).

Traditionally associated with this harsh environment have been the constant dangers of fire, frostbite, and getting lost in the dark (McGuire and Tolchin 1961). However, with improvements in station facilities and technology, these are not considered important stressors. In fact, the absence of much hardship and danger, and the relative luxury of living conditions, are occasionally sources of considerable disappointment and disillusionment (Blair 1983; Mullin 1960).

As Lantis (1968) points out, however, it is the social environment rather than the physical environment which is the most potent source of stress in polar regions. In Antarctica, this social environment is characterized by prolonged isolation. Severe weather conditions during the austral winter prohibit travel to and from the continent and radio and satellite communication is frequently interrupted for extended periods. This isolation generates both external and internal stressors for station personnel. External stressors include the inability to contact family and friends, real or imagined unpleasant events at home (Strange and Klein 1974), and feelings of rejection resulting from delays in arrival of relief parties, shortages in supplies, or actions of authority that interfere with established routines or disappoint seemingly trivial expectations (Natani and

Shurley 1974:111). Internal stressors include the lack of privacy in cramped quarters, boredom due to the lack of environmental stimulation and interaction with the same limited number of individuals, sexual deprivation, reductions in the gratification of basic human needs of affection, security, and feelings of personal significance, and the absence of statuses and roles which define one's social position in the outside world (Natani and Shurley 1974; Rohrer 1961).

The Winter-Over Syndrome

Exposure to these social and environmental stressors results in numerous physiological and psychological changes among winter-over personnel. Gunderson (1968), for example, found that the incidence of mental disorders among Navy personnel assigned to Antarctic duty was approximately three times higher than among Navy personnel in general. Cases of psychoses or severe neuroses have been extremely rare, but the few cases which have occurred were serious in nature.

Despite the potential for these forms of mental disorder, psychological stress in the Antarctic is manifested in a common set of symptoms. Many individuals experience mild to moderate psychological disturbances after several months of winter confinement. The symptoms listed below have been found to some extent in every group of men wintering in Antarctica regardless of national origin. They are: (1) insomnia, popularly known as 'big eye'; (2) irritability; (3) headache; (4) nightmares; (4) anxiety; (6) depression; (7) boredom; (8) fatigue; (9) decline in personal hygiene; (10) reduced motivation combined with intellectual inertia, impaired memory, impaired concentration, decline in alertness, and a general apathetic state; (11) increased appetite, frequently accompanied by weight gains; (12) digestive ailments; (13) rheumatic aches and pains; and (14) increased sensitivity to physical and social stimuli. These symptoms appear to increase over time during the winter, peaking at mid-winter. Strange and Klein (1974) have grouped these symptoms into a general phenomenon known as the "winter-over syndrome". This syndrome has four major components: (1) depression, (2) problems of hostility, (3) sleep disturbance, and (4) impaired cognition.

Alcohol-related problems have also been commonly but not universally reported in Antarctic stations. At one American station a few years ago, "there was a widespread perception and outspoken assertion that alcohol was used excessively by certain individuals, and that this excessive use was deleterious to the community (because of noise, rowdy behavior, and fighting) and to the mission of the command (because of alcohol-related injuries and motor vehicle accidents" (Blair 1983). In fact, of the 65 Naval personnel at this station, a formal evaluation for alcohol rehabilitation was recommended for thirteen. Strange and Klein (1974:413) note that the misuse of alcohol has caused two types of problems to occur in the Antarctic: (1) chronic excessive over-indulgence by older, more senior personnel interfering with their leadership ability; and (2) acute intoxication causing release of aggressive behavior, particularly in the younger men, and stimulating violent behavior in the group.

In normal society, such behavior is clearly maladaptive. In the Antarctic, however, it

represents the adaptation and exhaustion stages of the general adaptation syndrome (Popkin et al 1978:480). Haggard (1964) concluded that man usually cannot adapt to extreme or extended isolation without showing some of the symptoms that typically characterize the mentally ill. He suggested that it is the absence of familiar, meaningful objects and relationships, as well as the presence of the unfamiliar that produces the disturbances associated with isolation.⁴ Moreover, these disturbances are usually restricted to the station itself. A long-term follow-up study by Palinkas (1985) found no adverse effects of winter-over duty on the physical or mental health and performance of enlisted Navy personnel.

Variations in Psychosocial Adjustment

While the winter-over syndrome represents a common response, there exist wide variations in the expression of this syndrome and the degree it adversely affects the health and performance of station personnel. Three sets of factors in particular appear to influence the process of psychosocial adjustment in all Antarctic research stations. The first is observed in individual traits of station personnel. According to Biersner and Hogan (1984), adjustment is a function of narrow interests and a low need for social stimulation. Being interested in many hobbies and activities consistently predicts poor performance "on the ice" (Gunderson and Nelson 1965). Extroverts are less successful at adapting to this environment than more inner-directed, quiet, retiring types (Strange and Youngman 1971:255). The latter individuals are characterized as "educated isolates," self sufficient, intelligent, quiet, calm and independent (Kay 1984; Palmai 1963). These "educated isolates" score higher on performance evaluations and report for sick call significantly less often than more group-centered personnel (Palmai 1963). Natani and Shurley suggest that "the isolates may thus individually and as a group establish internal routines and external expectations that seem idiosyncratic and immature or unrealistic to an outsider but that are extremely important to the station party for structuring time,⁵ maintaining self-identity, and providing social security" (1974:110).

Personality traits do not uniformly predict for adaptation, however. Personality measures obtained during the screening process prior to Antarctic duty display important subgroup differences such that one scale may predict for the successful adjustment of one group but not for another. According to Gunderson (1966), the psychological needs and characteristics that were predictive of good emotional adjustment for Navy men were not necessarily favorable for the civilian personnel. This leads us to consider the second set of socio-cultural influences which include the sociocultural background of station members. At all research stations, members are characterized by different cultural and subcultural backgrounds. American stations, for instance, have traditionally been staffed by Navy personnel and civilian scientists who are members of the United States Antarctic Research Program (USARP). Individuals also are distinguished by differences in socioeconomic status, particularly education and occupation. The Navy group is further distinguished by their rank and occupation, with technical-administrative and seabees comprising the two main subgroups of enlisted personnel. Age differences and, as more women begin to winter-

over, sex differences also characterize the social groups of all stations.

These differences in sociocultural background are evident in different tastes in music, different hobbies and leisure activities, and values. Gunderson (1968) indicated that civilian scientists expected to receive delayed professional rewards and satisfactions from their work. The Navy men, on the other hand, were dependent upon more immediate rewards such as the approval of their associates and supervisors, promotion in rank, and a desirable assignment for their next duty station.⁶ Sociocultural differences also are reflected in coping styles. Civilians and enlisted personnel differ significantly in their psychological response to the Antarctic environment (Natani and Shurley 1974:109). Mullin (1960) for example, indicated that hostility was vented by Navy personnel in horse-play, swearing, complaining, and exchanging insults. Among the civilians, however, hostility is repressed, which might account for the relatively high frequency of headaches among this group. These differences in adaptation are reflected in differences in health and performance. Navy personnel have been found to have lower job morale (Gunderson 1974:125), much higher incidences of insomnia and depression (Sater 1969:218), and more than twice the average number of sick calls than civilians (McGuire and Tolchin 1961:957). Other factors besides military or civilian status appear to affect styles and levels of adjustment to the Antarctic environment. Education, socioeconomic status of father, and age also appear to be negatively correlated with emotional symptoms (Gunderson 1966:632).

The third set of influences comprise the sociocultural systems or "microcultures" (c.f., Natani and Shurley 1974) of the stations themselves. These systems differ from country to country, station to station, and even year to year as personnel rotate in and out of stations. Oftentimes, they are a reflection of the individual personalities of station personnel. Nevertheless, there are points of commonality and continuity. One element that almost all stations have in common is their scientific mission. Researchers engage in a wide variety of studies in the biological and medical sciences, meteorology and atmospheric sciences, earth sciences and glaciology, astrophysics and space sciences, and ocean sciences. Much of this work is tedious and exact, requiring long hours, laboratory and field work, and adherence to guidelines for research behavior layed out by each discipline. In addition to the scientific research, station personnel are engaged in support activities. These include facility maintenance and renovation, supply, construction, cooking, communications, and medical care. These activities at American stations have traditionally been assumed by U.S. Navy personnel, but are increasingly being performed by civilian contractors.

In addition to their work activities, research stations engage in similar forms of social behavior relating to leisure and recreation. Some of these activities take the form of rituals. At New Zealand stations, for instance, "packing" (stuffing one's trousers with snow) is a common form of initiation of personnel who are "on the ice" for the first time. Most stations also have parties at certain times of the year, such as mid-winter. More regular forms of entertainment include bull sessions, movies, reading, and drinking. Other types of behavior distinguish one station from another. Nelson, for example, com-

ments that:

In visiting Antarctic station groups, one can observe many cultural features that over the years have differentiated groups. Some are surmised to have been of short-term value to the groups; others perhaps "carried them through" the long winters. Examples are the "home town" street names assigned to snow paths in a camp; the Burma Shave limerick signs alongside a snow trail leading to "town," a reference to the station camp; a winter Olympics held at another station; an institutionalized pet cat at one station and the adopted indigenous penguins at another; and a station "flick" created by group members who spliced segments of many different commercial movies, all of which had been viewed individually to the point of boredom (1973:177).

Another common component of the sociocultural systems of each station is a value system which gives meaning to and orders the behavior of station members and which regulates social interaction. These values include motivations for Antarctic duty, valued personality characteristics, and rules for social behavior. Common reasons for volunteering for Antarctic duty include earning and saving money, broadened experience, advancement, prestige, intellectual curiosity, increased technical knowledge, and independent action. Personnel also are occasionally motivated by the desire to escape from the demands of the larger society such as marital or family problems and problems with authority. Desired personality characteristics while on the ice include positive mood and job attitude, self-sufficiency, interesting experiences, enthusiasm, and good communication skills (Kay 1984). Rules of social behavior include the norm of preservation of common areas by removing outside shoes, the strong reaction to gross misbehavior in cafeterias which serve as the social center of the community, norms of cooperation which include criticism for those who fail to perform assigned community tasks such as housekeeping or water system maintenance, and disdain for excessive drinking (Blair 1983).

Also common to the sociocultural systems of Antarctic research stations are the processes of group formation and group conflict. Three distinct stages of group formation occur in these stations. In the first stage, the group is open, consisting of individuals who are removed from the direct influence of their accustomed sociocultural framework and are forced to intermingle with an extremely heterogeneous group. A common response to this situation is depression, loss of hope, and social withdrawal to "wait out" the winter (Natani and Shurley 1974:96). The second stage involves subjective exaggeration of the group heterogeneity and the formation of subgroups. The basis for formation varies considerably, sometimes age and authority, with an older group and a younger group; sometimes occupation with a scientific group and a military group; sometimes recreational interests with a drinking group and a nondrinking group. Clique formation have also been based on tastes in music (rock, country & western, and classical) (Strange and Youngman 1971:257) and religious beliefs (Blair 1983). The third stage is marked by "a period of intense personal social comparison, followed by the evolution of a new homogeneous microculture somewhat different from any of the microcultures originally represented by the individual men and adapted to this special environment" (Natani and Shurley 1974:96). Despite this homogeneity, however, "at least one member is isolated from the group, or a peripheral clique forms even though most of the station are in the core group" (Strange and Youngman 1971:257).

A critical part of this third stage is the formation of a group identity which appears to facilitate the adjustment process of individual members. This identity manifests itself in particular instances. Confrontations with outside authorities over delays in supply deliveries or changes in orders, for example, create a feeling that the outside world does not appreciate the circumstances under which the group as a whole must operate even though only certain members may be directly affected by outside actions. Emergencies also serve to unite the group. An incident at South Pole Station witnessed by Natani, for example, led him to conclude that change, even a stressful change, contributes to the positive aspects of adaptation by raising the men's self-confidence and fostering group cooperation. Even when there is little need for concerted effort by the community at large, there is usually an explicitly stated social norm that the community is a mutually supportive integrative whole which will deal with stress by concerted effort (Blair 1983). Finally, group identity is particularly visible at the end of the winter-over period. There is often an almost universal sense of resentment at the invasion of the station by replacement personnel who are regarded as "outsiders," who lack the experience and tradition of the community, are unfamiliar with the rules of appropriate behavior "on the ice," and who often express opinions critical of the accomplishments of the winter-over community (Blair 1983). The break-up of the community also creates stress for each member who must now return to the larger society as individuals. "At this time they want reassurance that society will afford them as much social security as the group has during the winter" (Natani and Shurley 1974:111).

While the formation of a group identity can be attributed to the social comparison processes which contribute to homogeneity, such processes can also produce conflict as well. In American research stations, group conflict has traditionally occurred between the military and the civilians.⁷ According to Natani and Shurley,

In general, the Navy personnel tend to consider the station a Navy facility, feel a sense of ownership for equipment not used daily by the USARPs in their work, and view the USARPs as guests in their facility. At the same time the USARPs feel that the station is a scientific facility and that their work has priority and view the Navy as being on hand to attend to the tasks of station operation and to lend the USARPs assistance as needed (1974:98).

Underlying these conflicts between civilians and military personnel are fundamental differences in lifestyles and values. Strickland (1964), for example, notes the inherent difference between the disciplined, regulated, conservative activities of the Navy personnel on the one hand and the relatively unstructured, disorderly, independent life-styles of the scientists on the other. These differences are reflected in the following passages taken from station logs:

A strange week with no little tension building between Navy and USARP. Source is USARP attitude toward general helpfulness in the galley. Three or four are flagrantly unhelpful. My men choose to express their objection through noisy rudeness over beer in the movie. ...Three sources of Navy USARP friction. First - the naval enlisted men are told in Davisville to treat all USARP as they would Navy LTCDRs (Lieutenant Commanders). This would be fine if USARPs behaved like Navy LTCDRs, but they don't - don't want to - don't know the first thing about the manners involved. So they fail to respond appropriately. They want to be treated like people without any structural relationships in the way. Second - there is a tendency for some USARP to make the Navy enlisted men feel like servants. This is disastrous when it happens. Third, the Navy enlisted men are acutely aware of the disparity in education

between the two groups. A few USARP underscore this - e.g. "when so an so is talking, half the time we don't understand a word he says." And on the other hand, the USARP are led to feel like heroes- like important scientists - in the months before they leave the States. They're usually disillusioned in their first month on the ice and have to begin rebuilding (Officer in Charge, Byrd Station).

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The USARP quarters look like a pig pen. Mr. Thomas does not sleep there, he is the SSL (Station Science Leader, a civilian), but has tried to get them to clean it up, but they have told him plenty of times that they will do as they please and he can not do much about it, since there are no rules for USARP personnel to obey while on the ice. The Navy quarters are kept as clean as possible, bunks are made, personnel take showers every 5 days and wash their clothes every 10th day when they have the duty. Navy men continue the wearing of clean clothing. So here at this station we have 7 men that keep square away and 3 that continue to live like pigs which are by name Hawley, Johnson, and Smith, all USARP personnel. (Officer in Charge, Eights Station).

Age differences also lead to conflicts within a station. At one New Zealand station, for example, Taylor records that "the younger men complained that too much of the power rested with the older members of their party and that the recreational desires were so different as to be irreconcilable" (1974:426).

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Social conflicts also frequently occur between the core group of a station and individuals or small cliques whose values are widely divergent or whose behavior violates group norms. Individuals who drink heavily, for example, are often viewed with suspicion and ostracised from the rest of the group (Blair 1983). Individuals who are uncommunicative, hostile, moody, or who display poor personal habits also are subject to ostracism. An example is provided in the following passage taken from the log of an Officer in Charge at Eights Station.

During the week, all Navy personnel were noticed avoiding being around close to Johnson, USARP, due to foul body odor. Also they seldom talk to Smith, USARP. It is hard to describe this individual in words, seeing is believing in this case (in another passage, this individual was described as a "hobo" who had not shaven or changed clothes in months). I myself only talk to him and then it is about work, nothing else.

Social conflict appears in a variety of forms. At New Zealand Stations, for example, "open expression of aggression tended to be avoided, but aggression was expressed through arguments about politics and similar issues" (Taylor 1974:1969). Often, conflict occurs after drinking at station parties. These conflicts can erupt into confrontations and violence as the following examples indicate:

Jones fell in passageway after drinking bout and fractured metacarpal. He had previously tried to pick a fight with Smith and threatened Thomas. All of the three or four arguments that bordered on a fight plus many smaller disagreements have been precipitated by alcohol ingestion...Almost all the Navy and two or three USARPs have been drunk sometime during the year. The USARPs have so succumbed only a few times but several of the Navy drink just to get drunk and succeed admirably on beer alone (Officer in Charge, South Pole Station).

On Sunday CMA2 Anderson and CS2 Franklin grossly inebriated. Anderson, as usual, was belligerent - displaying hostility especially toward USARPs, less so towards me (Officer in Charge, Plateau Station).

Interrelations Among Sociocultural Factors

In an attempt to account for variations in the "winter-over syndrome," three observations are relevant. First, individuals with inner-directed or intraverted personalities appear to adapt better to Antarctic life than those with group-centered or extraverted personali-

ties. Second, subgroups representing certain sociocultural backgrounds such as the civilian scientists appear to adapt better than other subgroups such as Navy seabees (construction personnel). Third, the social comparison processes which generate group cohesion also generate group conflict. One of the strongest bases for this conflict has been differences in occupational status in the station itself.

In addition to the differences of socioeconomic status, values, and lifestyles of station subgroups, social conflicts reflect two conflicting psychological needs -- the need to be part of a group and the need to distinguish oneself or be independent from the group. Each of these needs are critical elements of one's self concept (Erikson 1968; Hallowell 1955). Human beings function in terms of concepts of self and society which, in part, are culturally determined (Geertz 1973; Hallowell 1955). In this case, these concepts are derived from three sociocultural systems: (1) Euro-American culture in general; (2) its subcultural variants (professional scientists, military); (3) and the microculture of the station itself. Variations in psychosocial adjustment in the Antarctic occur because members have different psychological coping strategies and because they have different conceptions of self which are influenced by their relative position in each of these three sociocultural systems. Poor levels of adjustment occur when individuals are helpless or powerless in both a psychological and a social sense. From a psychological perspective, extraverts cannot employ their coping strategy which is based on external supports to deal with the stressful environment because they are, for the most part, isolated from those supports and the value system of the station microculture which emphasizes self-sufficiency further weakens the efficacy of that strategy. Reliance upon one's social supports, which is adaptative from a health standpoint in the larger society (Berkman and Syme 1979; Cassel 1976; Cobb 1976), is maladaptive in the social environment of the Antarctic research station. Conversely, social withdrawal or isolation which is considered to be maladaptive from a health standpoint in the larger society (Chandra et al 1983; Lynch 1977), is adaptive in Antarctica. From a social perspective, those who adjust best are those who have the highest social status in all three sociocultural systems. Navy enlisted personnel, on the other hand, perceive themselves to have a status which is subordinate to that of the civilians because they serve in a support capacity, and because they lack the autonomy possessed by the civilians. This status is examined by all station members through the process of social comparison and appears to play a role in the determination of one's own perceived status and degree of control. "The Seabees' status and security, both based to a large extent on task accomplishment, may be threatened by the intimate presence of personnel with superior formal education who tend to evaluate their performances on dimensions unfamiliar to Seabees" (Natani and Shurley 1974:99). The social comparison process occurs for both groups. Both evaluate their own status in relation to others and derive certain implications as to the amount of control they may exercise over their environment. As indicated above, Navy enlisted appear to resent the autonomy of the civilians which they themselves lack. Even Navy officers express the need for discipline and control as this passage from a station log indicates:

This week the OIC instituted more rigid rules of conduct between officers and enlisted men as far as address and also separates them at

meals. This was met with some resentment but I think in the long run will be much better. In general his and my conclusions are that it is a mistake to relax these differences and we plan to recommend to relieving officers that fairly strict military courtesy be observed. (Medical Officer, Byrd Station).

Maintaining distance between officers and enlisted and contrasting Navy discipline with the disorderly behavior of the civilians both reflect the importance of the order provided by military authority as a way of maintaining control and coping with the stress of living in this harsh and isolated environment. The Navy represents a cultural system where external control and discipline are important. The presence of civilians and the leveling of status challenge these values creating social as well as intrapersonal conflicts.

Adaptation thus appears to be dependent in some degree upon one's personality which defines his coping style, his sociocultural background, and his role in the sociocultural environment at the station. Adaptation also appears to be related to aggression. All personnel experience irritability and depression as part of the winter-over syndrome. Those with less perceived autonomy (extraverts, Navy enlisted) display greatest aggressive tendencies, as evidenced by the examples of anger and hostility associated with drinking, and by the higher levels of hostility, symptoms of depression, and insomnia (Doll and Gunderson 1971). Aggression, therefore, can be seen as a response to the lack of perceived autonomy, or powerlessness, and self-esteem.

Conclusion

Psychological stress is a "normal" part of wintering-over in the Antarctic given the unusual living conditions of small groups, the harsh environment, and the prolonged isolation from outside contact. The degree of stress, however, is influenced by different sociocultural factors. Three in particular were examined in this paper: (1) those located in the individual personality; (2) those located in the sociocultural backgrounds of station personnel; and (3) those located in the sociocultural systems of the stations themselves. Certain conflicts emerge from the interaction of these influences. In particular, as the heterogeneity of social group increases so does the potential for interpersonal as well as intrapersonal conflict. The process of social comparison which fosters group homogeneity also serves to generate perceptions of relative control over the social environment and self-esteem. Those people who perceive themselves to be powerless because they cannot exercise autonomy in either a social or a psychological sense have the greatest difficulty in adjusting to the Antarctic environment. Resources enabling one to deal with similar conflicts in the outside world are absent here, and withdrawal from the social group during the winter is not a viable option. Other processes, such as values, group behavior, and group identity serve to bring together a group of individuals whose sociocultural and personality idiosyncracies are integrated into a cultural form common to the confined or isolated group.

Notes

1. In the past ten years, however, Chile and Argentina have sent "colonist" families to live on a semi-permanent basis in the Antarctic to enhance their claims to territorial

sovereignty in the event the Antarctic Treaty is ever repealed.

2. Because of the practical and methodological difficulties inherent in conducting ethnographic fieldwork in small, isolated social systems, especially in the Antarctic (c.f., Nelson 1973), this paper is based on the concept of "ethnography at a distance," using data collected principally from American, British, Australian, New Zealand, and French stations. Data on American stations include interviews with members of past winter-over expeditions, station logs, debriefing reports by Navy psychiatrists and clinical psychologists, personality profiles and biographical data obtained from the "Operation Deep Freeze" screening program, and data collected by Dr. Eric Gunderson on winter-over personnel.

3. The inability to evacuate one case of paranoid psychosis, for example, necessitated treating him with high doses of phenothiazine medications and isolating him from other station personnel (Strange and Klein 1974:414).

4. Nevertheless, efforts to reduce these disturbances and improve the performance of personnel assigned to Antarctic research stations have resulted in the development of screening programs such as the Operation Deep Freeze Program administered by the U.S. Navy. Each year, applicants for Antarctic duty are evaluated by a clinical psychologist and a psychiatrist. Those rated as acceptable by both members of the screening team are eligible for winter-over duty. From this pool of eligible applicants, personnel are selected on the basis of need for particular station assignments.

However, while these programs have been generally successful in reducing the number of cases of severe psychiatric disorders in the Antarctic and in selecting the best emotionally equipped personnel for winter-over duty, they are limited in certain respects as predictors of individual health and performance while "on the ice". Studies have shown that clinical evaluations are poor predictors of performance in Antarctica (Gunderson and Kapfer 1966). Moreover, the biographical and personality attributes of different subgroups are not equally effective as predictors of performance for each group (Gunderson and Nelson 1965).

5. These personality characteristics are reinforced by the microculture of the station and encouraged in all personnel. A study of personnel at a New Zealand station, for example, showed them to be significantly more self-reliant and more practical after the winter than they had been before (Taylor 1974:419). Increased self-sufficiency and independence has been reported in several studies (Taylor and Shurley 1971; Mullin 1960; Kay 1984). Reinforcement of these qualities also may help to improve the health of Navy personnel once they return to the United States. Winter-over personnel were found to have significantly fewer total first hospitalizations subsequent to their return from Antarctic duty than a control group of enlisted personnel who were accepted for Antarctic duty but who did not winter-over (Palinkas 1985). Thus, while the winter-over experience may have some negative short-term effects, in the long-term it appears to have a positive health effect.

6. Delays in receiving results from rate advancement exams or disappointment over failure to be assigned to desired duty stations upon completion of Antarctic duty were often reported in station logs as a considerable source of psychological distress among enlisted personnel. This distress added to group tensions and conflicts.

7. An example of such a conflict was a dispute between the two groups at the South Pole Station during the 1965 winter-over. The station mascot, a dog, constantly raided the food supply. The Navy officer in charge decided to handle the matter by incarcerating the animal, and some of the enlisted men suggested that the only real solution was to kill the animal. The civilians, who were especially fond of the dog, responded by setting it free and hiding it somewhere in the station. This led to increased tension between the two groups and several confrontations until a mutually acceptable arrangement was worked out.

8. The names in this and subsequent passages from station logs have been changed to protect the identity of those involved.

9. Interpersonal conflict and group homogeneity also may be affected by the quality of leadership exercised at these stations. Leaders at Antarctic stations must have the ability to tolerate intimacy and leveling of status without losing authority and the respect of the group. They must also be self-reliant (Strange and Youngman 1974:257). However, not all station leaders possess these qualities. In a comparison of the officer in charge at two stations, Biersner and Hogan found that "the homogeneous item composites (HICs) that characterized positive self- and peer-related adjustment also characterized the person who was in charge of the smaller of the two stations. This group had a highly successful winter period; maintenance and technical tasks were performed at consistently high levels and social compatibility remained high during the nine months of confinement. At the second station, the leader was characterized by those HICs correlated with negative peer ratings. At this station equipment was in poor repair, technical performance met only minimum standards, conflicts among group members were frequent and severe, communication equipment was inappropriately used, and the station was poorly prepared for the relief party at the end of the winter period" (1984:495). Poor leadership can also affect the health of station personnel. For example, the medical officer at one station reported that:

Chief (CPU) appears to be getting hurt quite frequently and responds to minor injuries with prolonged and often severe symptoms. There is very poor relations between him and OIC has retained most of the responsibilities but blames the CPU when anything goes wrong (Medical Officer, Byrd Station).

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emerge from the interaction of these influences. The process of social comparison which fosters group homogeneity also generates perceptions of relative control over the social environment and self-esteem. Those people who perceive themselves to be powerless or helpless because they cannot exercise autonomy in either a social or a psychological sense have the greatest difficulty in adjusting to the Antarctic environment. Resources enabling one to deal with similar conflicts in the outside world are absent here, while strategies such as social isolation may be viewed as adaptive in this particular environment. Other processes, such as values, group behavior, and group identity serve to bring together a group of individuals whose sociocultural and personality idiosyncracies are integrated into a cultural form common to the confined or isolated group. *Key words:*

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